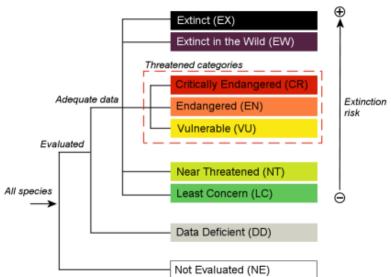
### **Critically Endangered Species Lesson Plan**

## (4<sup>th</sup>, 5th, 6th grade science)

**Objective**: To provide an understanding of critically endangered species, how they differ from endangered species, and why they are critically endangered.

#### **Definitions:**

- Critically Endangered Species: Critically endangered is the highest risk category
  that can be assigned to a species on IUCN Red List. These species are wild species
  whose populations are believed to have decreased by 80% within three
  generations.<sup>1</sup>
- Endangered Species: Endangered species face a lesser risk of extinction than critically endangered species; however they are still at risk. These species have wild population sizes so small that they are at risk for extinction.
- IUCN Red List: The International Union for Conservation of Nature (IUCN)
   established the IUCN Red List of Threatened Species as a way to determine the
   relative risk of extinction a plant or animal species faces based on its taxonomic,
   conservation status, and distribution information. <sup>2</sup>



**IUCN Breakdown of Threats** 

<sup>&</sup>lt;sup>1</sup> http://www.itsnature.org/category/endangered/critically/

<sup>&</sup>lt;sup>2</sup> http://www.iucnredlist.org/about

**Background:** The rapid decrease in population among these species means that we must put forth greater conservation efforts to ensure that these species do not go extinct. A species is determined to be critically endangered according to a set of criteria set forth by the IUCN. A species will be determined "critically endangered" if it meets any of the listed qualifications of the <u>Criteria for the Critically Endangered, Endangered, and Vulnerable Species</u>. Species listed as critically endangered can be found across the globe and in almost every family of wildlife. Many of these species are lesser known, which makes it much more difficult to conserve them. Additionally, these species face a wide range of threats based on their regional location and their biological composition. Currently there are 3,879 different species listed as critically endangered on the Red List. In comparison to the critically endangered species, there are 5,689 plant and animal species that are listed as endangered species. Though there are more endangered species, they face a lesser risk of extinction than those species listed as critically endangered.

**Background (Student Version):** Critically endangered species face a greater risk of extinction than species considered to be endangered. Generally speaking, a species is considered to be critically endangered if its population has decreased, or is decreasing, by 80% within three generations, or 10 years whichever comes first. Many of the 3,879 critically endangered plant and animal species are lesser known and more difficult to conserve.

Classroom Assignment: Planned for three-four 45 minute class periods

- Day 1: overall lesson and presentation on critically endangered species and have the class complete the attached games (can be all completed in class or assigned as homework):
  - One of these is not like the other
  - Various Word Searches, Scrambles and Crosswords
- Based on the class size, each child or group of children will select 1-3 species from the attached list of Critically Endangered Species. Species should be drawn from a hat or in some other equitable manner.
- Day 2: students should spend time researching their assigned species, focusing on their habitats, life span, diet, mating and hunting habits and at least two threats that the species faces. Students should work to include pictures into their presentation.
  - Resources include: Arkive.org; Animaldiversity.ummz.umich.edu; Animals.nationalgeographic.com; Sandiegozoo.org; Philadelphiazoo.org; IUCNRedlist.org
- Day 3: each student or group of students will spend 3-5 minutes presenting the research they found.
- After all species have been presented, conduct the provided trivia review game. (can be finished on Day 4 if necessary)

<sup>&</sup>lt;sup>3</sup> http://www.iucnredlist.org/apps/redlist/search

• Day 3 or 4: Once review game has been completed, allow the class 20-30 minutes to complete the provided Critically Endangered Species Quiz.

**Assessments:** Students should be assessed based on the quality of their presentation and the grade they receive on the provided quiz. A student receiving top marks should be able to sufficiently represent their species and why it is critically endangered, be able to differentiate between endangered and critically endangered species, and show an understanding of why these species are in need of conservation efforts.

**Skills learned:** At the completion of this assignment students should have a better understanding of the diversity of animals, international conservation threats, and how to research and communicate their findings.

#### Suggest Craft/In-Class Activities for Day 4 or after:

- Critically Endangered Species Shadow Puppets
- Homemade Habitats: Shoebox/jar replicas of the habitats in which these species can be found
- Critically Endangered Species Origami
- Scavenger Hunt: have students locate either the animals, things found in their habitats, or objects that represent the threats these species face.

#### National education standards met by this lesson:

From the National Research Council – A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas – From which Next Generation Science Standards are currently being developed

#### <u>Dimension 1: Scientific and Engineering Practices</u>

- 1. Asking Questions and Defining Problems students will be able to ask about status of and threats to species as well as explaining why the loss of species is a problem. Students will be able to define the characteristics of a species habitat by examining pictures, maps, and descriptions of the animals' needs.
- 5. Using Mathematics and Computational Thinking advanced students will be able to quantitatively represent population declines or recoveries as graphs or percentages. Students will be able to explain what it means for a study to be "data deficient."
- 7. Engaging in Argument from Evidence students will be able to use reasoning, argumentation, and evidence to make a case for conservation.
- 8. Obtaining, Evaluating, and Communicating Information students will be able to research and gather information about species and will use effective oral communication to convey their research to their peers. Students will also be able to answer trivia game and assorted types of quiz questions to convey their understanding of threats to endangered species, categories of risk, and legal protections of species.

#### **Dimension 2: Crosscutting Concepts**

- Cause and Effect students will be able to explain social and/or biological causes for population
  declines in describing threats to species; they will be able to explain effects of protections as
  well as effects that might occur from the loss of the species.
- 4. Systems and System models an opportunity to extend the lesson depth for advanced students would include a discussion of the complexity of ecosystems, visual representations of food webs, and explanation of the integral role of any given species within the system.
- 7. Stability and Change students will demonstrate understanding by explanation of how changing animal populations can cause instability in the natural world.

#### <u>Dimension 3: Disciplinary Core Ideas – Life Sciences</u>

- LS2.A. Interdependent Relationships in Ecosystems students will be able to explain species' roles in the ecosystem and how the species meets its needs for food and shelter. A student will be able to create a food chain including the species he/she has researched.
- LS2.C. Ecosystem Dynamics, Functioning, and Resilience students will be able to explain why and by how much critically endangered species' populations have declined.
- LS2.D. Social Interactions and Group Behavior students will be able to describe the family/group structure of the species studied. More advanced students will be able to explain the changes in group dynamics caused by population reduction.
- LS4.C. Adaptation students will be able to explain how changes in the environment can adversely affect populations of critically endangered species.
- LS4.D. Biodiversity and Humans students will be able to explain how human behavior affects critically endangered species' populations. Students will be able to explain how humans might be affected by the extinction of a species.

## From the Common Core State Standards for English Language Arts and Literacy in History/Social Studies, Science, and Technical Subjects – Grade 5

- RI.5.1. Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.
- RI.5.2. Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.
- RI.5.4. Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a *grade 5 topic or subject area*.
- RI.5.6. Analyze multiple accounts of the same event or topic, noting important similarities and differences in the point of view they represent.
- RI.5.7. Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.
- RI.5.9. Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.
- W.5.7. Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic.

- W.5.9b. Draw evidence from literary or informational texts to support analysis, reflection, and research. b. Apply *grade 5 Reading standards* to informational texts (e.g., "Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point[s]").
- SL.5.4. Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.
- L.5.4 Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on *grade 5 reading and content*, choosing flexibly from a range of strategies.
- L.5.6. Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal contrast, addition, and other logical relationships (e.g., however, although, nevertheless, similarly, moreover, in addition).

#### **Lesson Plan Materials**

#### **Critically Endangered Species List:**

As you will note there are thousands of critically endangered species across the globe, however the follow list accounts for the 54 that we work with. The list has been broken down by region and species type.

Africa	Ploughshare Tortoise (Madagascar)
African Penguin (Coast of South Africa)	Ethiopian Wolf (Ethiopia)

Hirola Antelope (Between Kenya and Somalia) Grevy's Zebra (Kenya and Ethiopia)

Blue-eyed Black Lemur (Madagascar) Egyptian Tortoise (Nile Delta and also into

African Wild Dog (Botswana, Kenya,
Mozambique, South Africa, Tanzania, Zambia,
Mexico, Central, and South America

Zimbabwe)

Tome's Long Eared Bat (Southern Mexico,

Duiker (Africa generally)

Central America through Southern Peru and
Southern Brazil)

Sidamo Lark (Ethiopia)

Andean Cat (Andean Mountain Range)
Pennant's Red Colobus Monkey (Central West

Africa) Blue-Billed Curassow (Northern Colombia)

Red Colobus Monkey (Central and East Africa)

Cauca Poison Frog (Colombia)

Madagascar Pochard (Madagascar)

Panamanian Golden Frog (Panama)

Giant Sable Antelope (Angola) Iquitos Gnatcatcher (Peru)

Jaguar (Americas generally)	Spoon-Billed Sandpiper (SE Asia)
Brown Spider Monkey (Colombia and	Red-vented Cockatoo (Philippines)
Venezuela)	Philippine Crocodile (Philippines)
Parrots (Mexico)	Philippine Forest Turtle (Philippines)
Pygmy Three-toed Sloth (Panama)	Central and East Asia and Russia  Siberian Crane (Arctic, Asia, China, Russia and Siberia)
Cotton-top Tamarin (Colombia)	
Golden-lion Tamarin (Brazil)	
Andean Tapir (Andean Mountain Range)	Snow Leopard (Central Asia)
Central American River Turtle (Southern Mexico through Northern Honduras)	Markhor (Afghanistan, Pakistan, Tajikistan and Uzbekistan)
White-Winged Guan (Peru)	Sakhalin Taimen (NW Pacific Ocean)
Southeast Asia	Spoon-billed Sandpiper (NE Russia)
Siamese Crocodile (Cambodia)	Island Nations
Bengal Florican (Nepal and India)	Polynesian Ground-dove (Polynesia)
Douc Langur (SE Asia generally)	Ridgeway's Hawk (Haiti and Dominican Republic)
Tonkin Snub-nosed Monkey (Vietnam)	
Pygmy Hog (India)	Kagu (New Caldonia)
Maleo (Indonesia (Sulawesi))	Antiguan Racer (Antigua)
Bali Starling (Indonesia (Bali))	Birds
River Terrapin (India)	Reptiles
Cantor's Giant Soft-shell Turtle (SE Asia)	FishAmphibian
Vietnamese Pond Turtle (Vietnam)	
White-rumped Vulture (SE Asia)	Cats
Markhor (India)	Primate

### **Critically Endangered Species Word Search Solutions**

R E A M G + S + T + S + + + D + N D + S + + D + V + + IYLNAI+I Ρ + + E L A A N Ε U С OL+RIUC0 A A + K R I E N + E + N I O B + B W + I P + E+ N U G O T + R DAEN N ++ N M R + $\mathbf{E}$ U + O T U + S O I Z E O B + + A A R O U + R + M + A C A S A S D + ID+ECNL  $\mathbf{E}$ S 0 ΝΥ BENRN A L H + ΕI В F D A I A R + + R U V R D L U + G A C L M + N E K M A + C+ E B + A M E A + T + I EF + A R S +R + + R + + O E C S + A + A + + D ++ + AAGI + F 0 + + L L C E C Τ + M I D N ORRAPAOTRN + C ++AAAGSE ETTRUTREV IRNAC IREMALARTNECDR B N + N + L D+ + U + P T W D LΡ G Ε С P O S Ρ Α 0 + +Α + ++ + Α + 0 Η + G C + S + H + ARL+TOY+GE +Ι +D O I L + U H + O + K Ρ + OSNF S + N +S LΡ Т R +U + 0 Τ Η + Ε Ι 0 + P R R + I E T S A N I +M Ι G + + H + T H W + D + U D+S N A + + + A+ P 0 + S + O E K + Α +N ++Ι Ι H + СL S Α L + Α  $\mathbf{E}$  $\mathbf{E}$ S ΕM R +R +Т + N + Ρ C + A Ρ O L Y N Ε S U IANGRO G Τ R Ρ G ILR Τ S + + N Α Ι L Α В 0 ABROWNOO OTAKCOCDETNEVDER С LNAUGDEGNIWE Τ I H W 0 ΗI Ε TERUMP Ε D  $\nabla$ U L Τ U R  $\mathbf{E}$ N H T O L S D E O T E E R H T Y M G Y P M O N K E Y I C PYGMYHOG++AFRICAN PEGU I N L + H + + I ANT ORTOI S E + G + S N O W ΕO Ρ + N I K N O T O + 

(Over,Down,Direction)
AFRICANPEGUIN(22,17,N)
AFRICANWILDDOG(14,1,SW)
ANDEANCAT(18,29,E)
ANDEANTAPIR(2,11,NE)
ANTIGUANRACER(21,13,NW)
BALISTARLING(30,30,W)

BENGALFLORICAN(18,30,W)
BLUEBILLEDCURASSOW(28,1,S)
BLUEEYEDBLACKLEMUR(5,1,SE)
BROWNSPIDERMONKEY(5,22,NE)
CANTORSGIANTSOFTSHELLTURTLE(2
7,29,NW)
CAUCAPOISONFROG(8,26,E)

CENTRALAMERICANRIVERTURTLE(2 5,26,N)COTTONTOPTAMARIN(30,29,NW) DOUCLANGUR(10,1,SW) DUIKER(24,21,N) EGYPTIANTORTOISE(30,22,N) ETHIOPIANWOLF(22,9,SW) GIANTSABLE(29,10,N) GOLDENLIONTAMARIN(29,10,S) GREVYSZEBRA(15,18,SE) HIROLAANTELOPE(24,2,S) IQUITOSGNATCATCHER(18,1,SW) JAGUAR(18,6,NE) KAGU(26,26,SE) MADAGASCARPOCHARD(1,29,E) MALEO(1,25,E)MARKHOR(12,22,W)PANAMANIANGOLDENFROG(26,1,S) PARROTS(7,19,NW) PENNANTSREDCOLOBUSMONKEY(1,2 4,NE) PHILIPPINECROCODILE(27,19,N)

PHILIPPINEFORESTTURTLE(1,28,E) PLOUGHSHARETORTOISE(1,24,E) POLYNESIANGROUNDDOVE(20,1,SW) PYGMYHOG(16,17,SE) PYGMYTHREETOEDSLOTH(4,19,NE) RAPTORS(8,1,SW)REDCOLOBUSMONKEY(21,25,W) REDVENTEDCOCKATOO(23,20,N) RIDGEWAYSHAWK(2,10,SE) SAKHALINTAIMEN(15,21,NW) SIAMESECROCODILE(16,1,SW) SIBERIANCRANE(8,21,NE) SIDAMOLARK(20,10,NW) SNOWLEOPARD(11,21,NW) SPOONBILLEDSANDPIPER(20,23,W) TOMESLONGEAREDBAT(18,22,NW) TONKINSNUBNOSEDMONKEY(1,1,SE) VIETNAMESEPONDTURTLE(28,26,NW) VULTURES(30,1,S) WHITERUMPEDVULTURE(18,27,W) WHITEWINGEDGUAN(7,1,SE)

### **Critically Endangered Species Crossword Solutions**

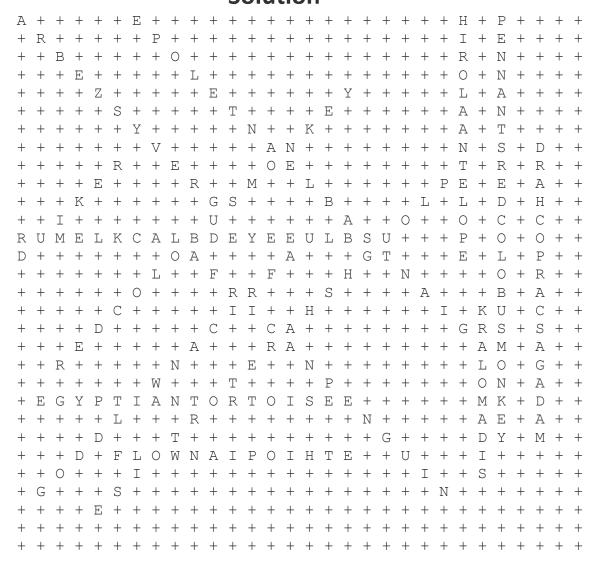
#### Across:

- 2. Jaguar
- 3. Pygmy Hog
- 4. Vultures
- 6. Hirola Antelope
- 8. Markhor
- 11. Andean Cat
- 12. Siamese Crocodile
- 15. Kagu

#### Down:

- 1. Cantor's Giant Soft-Shell Turtle
- 5. Blue-eyed Black Lemur
- 7. African Wild Dog
- 9. Raptors
- 10. Maleo
- 13. Ethiopian Wolf
- 14. Duiker

## African Critically Endangered Species Solution



(Over, Down, Direction)
AFRICANPENGUIN (10, 14, SE)
AFRICANWILDDOG (15, 14, SW)
BLUEEYEDBLACKLEMUR (18, 13, W)
DUIKER (1, 14, NE)
EGYPTIANTORTOISE (2, 22, E)
ETHIOPIANWOLF (18, 25, W)
GIANTSABLEANTELOPE (24, 18, NW)

GREVYSZEBRA (11,11,NW)
HIROLAANTELOPE (24,1,S)
MADAGASCARPOCHARD (28,24,N)
PENNANTSREDCOLOBUSMONKEY (26,1,S)
PLOUGHSHARETORTOISE (23,10,SW)
REDCOLOBUSMONKEY (3,20,NE)
SIDAMOLARK (25,26,N)

## Critically Endangered Species One of These Is Not Like the Others Solutions

#### Solutions:

- 1. Maleo—all others African Species
- 2. Jaguar—all others reptiles
- 3. Pygmy Hog—all others birds
- 4. Ethiopian Wolf—all others species of SE asia
- 5. Madagascar Pochard—all others cat species
- 6. Grevy's Zebra—all others from Mexico and Latin America
- 7. Tome's Long Eared Bat—all others from island nations
- 8. Sakhalin Taimen—all others mammals
- 9. Iquitos Gnatchatcher—all others from Central/East Asia and Russia
- 10. Andean Tapir—all others birds

## Critically Endangered Species Word Scramble Solution

African Wild Dog Siberian Crane

Giant Sable Vietnamese Pond Turtle Jaguar Golden-Lion Tamarin

Antiguan Racer Parrots

Brown Spider Monkey Siamese Crocodile Raptors Cauca Poison Frog

Andean Tapir Markhor

Grevy's Zebra Spoon-billed Sandpiper

African Penguin River Terrapin

Ridgway's Hawk Secret Phrase: Wildlife Without Borders

### **Critically Endangered Bird Species Cross Word Solution**

Across:

1. Siberian crane

4. Bali starling

8. Kagu

13. Spoon-billed sandpiper

14. Maleo

15. Madagascar Pochard

16. Sidamo Lark

17. Polynesian Ground Dove

Down:

2. Bengal Florican

3. White-winged Guan

5. Iquitos Gnatcatcher

6. African Penguin

7. Parrots

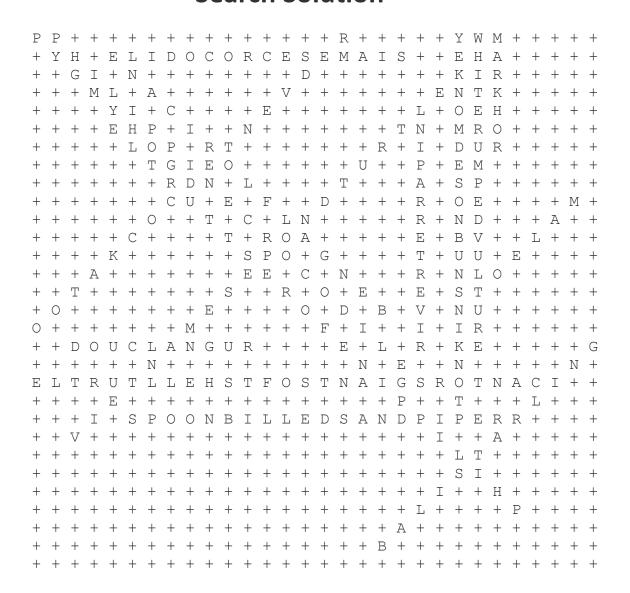
9. White-rumped Vulture

10. Blue-billed Curassow

11. Ridgeway's Hawk

12. Red-vented Cockatoo

## Southeast Asia Critically Endangered Species Word Search Solution



(Over, Down, Direction)

BALISTARLING (19, 29, NE)

BENGALFLORICAN (19, 16, NW)

CANTORSGIANTSOFTSHELLTURTLE (2

7, 20, W)

DOUCLANGUR (3, 18, E)

MALEO (29, 10, SW)

MARKHOR (25, 1, S)

PHILIPPINECROCODILE (2, 1, SE)

PHILIPPINEFORESTTURTLE (26,27, NW)

PYGMYHOG (1,1,SE)

REDVENTEDCOCKATOO (17,1,SW)

RIVERTERRAPIN (21,18,N)

SIAMESECROCODILE (20,2,W)

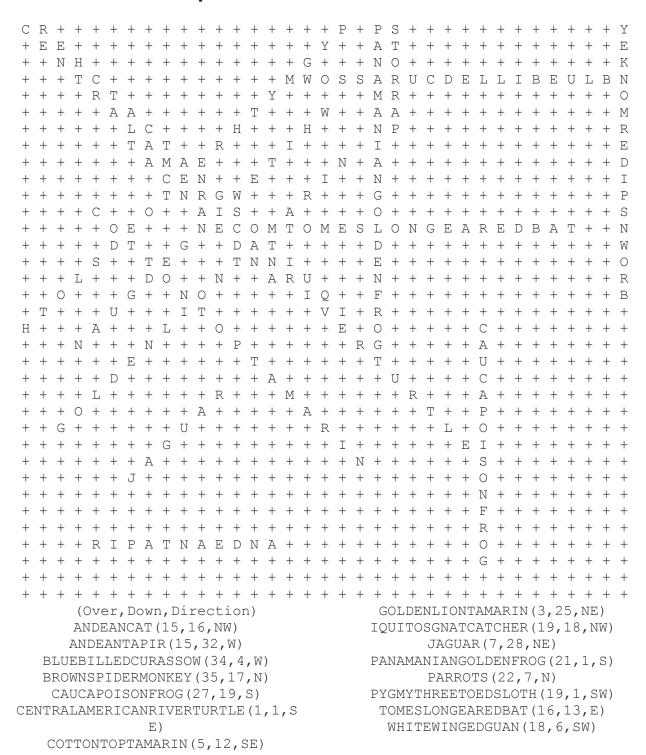
SPOONBILLEDSANDPIPER (6,22,E)

TONKINSNUBNOSEDMONKEY (23,21,N)

VIETNAMESEPONDTURTLE (3,23,NE)

WHITERUMPEDVULTURE (24,1,S)

## Mexico and Latin America Critically Endangered Species Word Search Solution



# Critically Endangered Reptile and Amphibian Species Cross Word Solution

#### Across:

- 3. Egyptian Tortoise
- 8. Antiguan Racer
- 9. Cantor's Giant Soft-shell Turtle
- 10. Philippine Crocodile
- 11. Panamanian Golden Frog
- 12. Philippine Forest Turtle

#### Down:

- 1. Central American River Turtle
- 2. Ploughshare Tortoise
- 4. Vietnamese Pond Turtle
- 5. River Terrapin
- 6. Siamese Crocodile
- 7. Cauca Poison Frog